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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/667,327	09/23/2003	Denis Thiot	003-084	1654

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EXAMINER	
MULLINS, BURTON S	

ART UNIT	PAPER NUMBER
2834	

DATE MAILED: 11/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/667,327	THIOT, DENIS	
	Examiner	Art Unit	
	Burton S. Mullins	2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9,11 and 12* is/are rejected.

7)☒ Claim(s) *10* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 05 November 2003 has been considered by the examiner.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-3, 5 and 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over GB 724,875 (GB '875) in view of Sapper et al. (US 3,969,643). GB '875 teaches a dynamo-electric machine including: a rotor 11 and stator 28 with a gap (not numbered, p.3, line 23) between the rotor and the stator, the gap having ends (Fig.3); baffles (not numbered, Fig.3) at the ends of the gap; a substantially hermetically sealed enclosure (outer housing 35) filled with a gaseous coolant (e.g., hydrogen, p.2, line 46) at superatmospheric pressure and including a coolant receiving region (not numbered, p.2, line 46-47) at each end of the rotor, adjacent

grooves/openings 13; the rotor and the stator positioned in the enclosure (Fig.3); the stator including a core 28 (Fig.3), cooling ducts 29 in the stator core (Fig.3), and windings 30 which form a winding overhang at each end of the stator (Fig.3), the rotor including cooling channels 13/16/17 (Figs.1,3&4); wherein, when the generator is operating, and when the generator is in fluid communication with a cooling apparatus (coolers 32) in fluid communication with the generator and inside housing 35, gaseous coolant flows in a circuit from the cooling apparatus 32 past the winding overhangs, then through cooling channels 13/14/16/17 in the rotor, then into said gap, then through the cooling ducts 29 in the stator core into the coolant receiving region (adjacent coolers 32), and then through the cooling apparatus 32 (see arrows showing circulation, Fig.3).

The baffles in GB '875 do not specifically "both [inhibit] escape of the gaseous coolant from the ends of said gap and [inhibit] entry of the gaseous coolant into the gap through its ends, the flow of gaseous coolant around said cooling circuit being caused solely by the centrifugal force acting on the gaseous coolant in the cooling channels of the rotor."

Sapper teaches a gas-cooled generator including a rotor 1 and stator 2 with a gap 17 between the rotor and the stator, baffles (dividing device) 8 each comprising extending cylindrical portion 10 at the ends of the gap (Fig.2); a substantially hermetically sealed enclosure (stator-rotor space 12) filled with a gaseous coolant at superatmospheric pressure; wherein, when the generator is operating, and when the generator is in fluid communication with a cooling apparatus (part of which comprises gas coolant flow outlet space 3), gaseous coolant flows in a circuit from the cooling apparatus past the winding overhangs 11, then through cooling channels 15 in the rotor, then into said gap 17, then through the cooling ducts

13 in the stator core into the coolant receiving region (flow outlet space) 3, and then through the cooling apparatus (inherent thereto), the baffles 8/10 both inhibiting escape of the gaseous coolant from the ends of said gap and inhibiting entry of the gaseous coolant into the gap through its ends by means of seal 18 (c.3, lines 29-35; c.4, lines 8-17), the flow of gaseous coolant around said cooling circuit being caused solely by the centrifugal force acting on the gaseous coolant in the cooling channels of the rotor (c.3, lines 35-41). Thus, the need to use an axial fan to provide additional pressure is eliminated (c.1, lines 21-31 & c.3, lines 38-39).

It would have been obvious to modify GB '875 and provide a baffle and seal per Sapper which inhibit escape of the gaseous coolant from the ends of said gap and entry of the gaseous coolant into the gap through its ends since they would have been desirable to eliminate the need to use an axial fan to provide additional pressure.

Regarding claim 5, though neither GB '875 nor Sapper teach specific ranges for the superatmospheric pressures inside their machines, it would have been obvious to provide a range of at least 10 bar since it has been held that optimum ranges involve ordinary skill. In re Aller, 105 USPQ 233 (CCPA 1955).

Regarding claim 8, the rotor comprises end portions which extend beyond the stator core, and axial and radial cooling channels 13/16.

5. Claims 1-5 and 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over GB 1,170,754 (GB '754) in view of Sapper et al. (US 3,969,643). GB '754 teaches a dynamo-electric machine including: a rotor 1 and stator 15 with a gap (not numbered, Fig.) between the rotor and the stator, the gap having ends (Fig.); baffles (shrouds) 25 at the ends of the gap; a substantially hermetically sealed enclosure (casing) 19 filled with a gaseous coolant (e.g.,

hydrogen, p.1, lines 29-44) at superatmospheric pressure and including a coolant receiving region (not numbered, Fig.) at each end of the rotor; the rotor and the stator positioned in the enclosure 19 (Fig.); the stator including a core (Fig.), cooling ducts 17 in the stator core and windings (Fig.) which form a winding overhang at each end of the stator (Fig.), the rotor including cooling channels 5/7; wherein, when the generator is operating, and when the generator is in fluid communication with a cooling apparatus (heat exchangers 29) in fluid communication with the generator and inside housing 19, gaseous coolant flows in a circuit from the cooling apparatus 29 past the winding overhangs, then through cooling channels 5/7 in the rotor, then into said gap, then through the cooling ducts 17 in the stator core into the coolant receiving region (passage 27), and then through the cooling apparatus 29 (see arrows showing circulation, Fig.).

The baffles in GB '754 do not specifically "both [inhibit] escape of the gaseous coolant from the ends of said gap and [inhibit] entry of the gaseous coolant into the gap through its ends, the flow of gaseous coolant around said cooling circuit being caused solely by the centrifugal force acting on the gaseous coolant in the cooling channels of the rotor."

As described in paragraph 5 above, Sapper teaches a gas-cooled generator including baffles (dividing device) 8/10 at the ends of the gap and a seal 18 (c.3, lines 29-35; c.4, lines 8-17), both of which enable flow of gaseous coolant around the cooling circuit solely by centrifugal force acting on the gaseous coolant in the cooling channels of the rotor (c.3, lines 35-41). Thus, the need to use an axial fan to provide additional pressure is eliminated (c.1, lines 21-31 & c.3, lines 38-39).

It would have been obvious to modify GB '754 and provide a baffle and seal per Sapper which inhibit escape of the gaseous coolant from the ends of said gap and entry of the gaseous coolant into the gap through its ends since they would have been desirable to eliminate the need to use an axial fan to provide additional pressure.

Regarding claim 5, though neither GB '754 nor Sapper teach specific ranges for the superatmospheric pressures inside their machines, it would have been obvious to provide a range of at least 10 bar since it has been held that optimum ranges involve ordinary skill. In re Aller, 105 USPQ 233 (CCPA 1955).

Regarding claim 8, the rotor comprises end portions which extend beyond the stator core, and axial and radial cooling channels 5/17.

6. Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over either GB '875 or GB '754, in view of Sapper, and further in view of Jampen (US 3,816,751). Neither GB '875, GB '754 nor Sapper teach helium as the coolant.

Jampen teaches that helium is known to be used in gas-driven turbogenerator sets for the purpose of cooling and because, unlike hydrogen, it is not combustible (c.1, lines 44-46; c.2, lines 30-35).

It would have been obvious to modify either GB '875 or GB '754, in view of Sapper, and employ a noble gas such as helium as the coolant in a turbogenerator per Jampen since helium can be used to cool the generator and is not combustible.

7. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over either GB '875 or GB '754, in view of Sapper, and further in view of Kudlacik et al. (US 3,702,964). Neither GB '875, GB '754 nor Sapper teach an exciter, per se.

Kudlacik teaches an internal static (non-rotating) exciter comprising supplemental excitation windings 20a in the stator slots for high response, simple control and range adjustment (c.2, lines 22-30) which can be integrated into gas cooled generators in a compact manner. The exciter provides compounded excitation power for the field windings (c.1, lines 5-10).

It would have been obvious to modify either GB '875 or GB '754, in view of Sapper, and provide an exciter per Kulacik since it would have been desirable to provide a responsive and easily-controlled means to produce compounded excitation power for the field windings.

8. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over either GB '875 or GB '754, in view of Sapper, and further in view of Crowdy et al (US 4,049,972). Neither GB '875, GB '754 nor Sapper a vertical generator.

Crowdy teaches that is desirable to position turbo-alternator plants vertically to reduce bearing loads (c.1, line 41-46).

It would have been obvious to modify either GB '875 or GB '754, in view of Sapper, and employ a vertical generator per Crowdy since a vertical orientation would have been desirable to reduce bearing loads.

Allowable Subject Matter

9. Claim 10 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art does not teach the claimed machine including part of the cooling flow flowing past a bearing.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Burton S. Mullins whose telephone number is 571-272-2029. The examiner can normally be reached on Monday-Friday, 9 am to 5 pm. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Burton S. Mullins
Primary Examiner
Art Unit 2834

bsm
02 November 2004